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(54) **Security system**

(57) A security system (20) for a portable asset (22), such as a vehicle, includes a user authorization unit (24) and an asset unit (26) mounted on or in the portable asset (22). The user authorization unit (24) includes an authorization signal generator and a transmitter to generate and transmit a signal to the asset unit (26). The transmitted signal identifies the bearer of the authorization unit (24) to the asset unit.

tion unit (24) to the asset unit.

When the portable asset (22) is stolen or otherwise moved without first receiving an authorization signal, a transmitter (36) therein transmits a signal identifying the asset unit (26) for example via a standard cellular telephone network. The asset unit (26) also includes a location device which allows the location of the asset (22) to be determined if stolen.

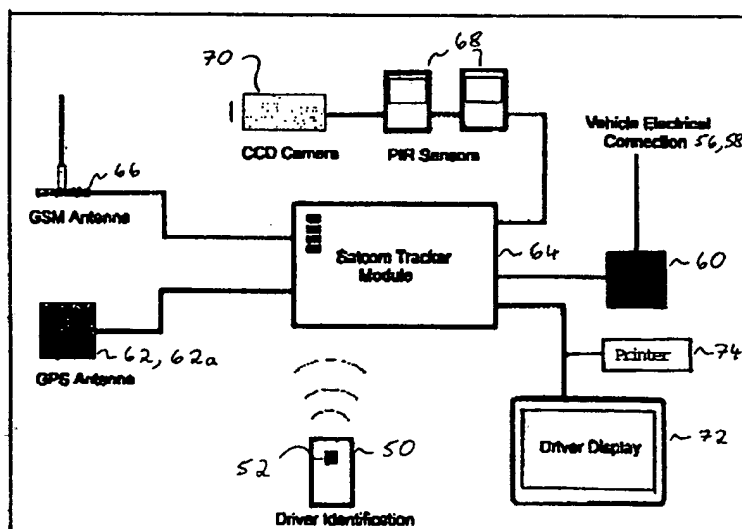


Figure 2

Description

[0001] The present invention generally relates to a security system for a transportable asset. In particular, the present invention relates to a security system for a transportable asset which can be used to automatically detect that an unauthorised person has moved or attempted to move the asset and then to automatically issue an informatory signal relating to this occurrence, detailing the asset's location.

[0002] Location devices for vehicles that have been stolen are becoming common. For instance, in the United Kingdom the Tracker™ system is increasingly being used to identify the location of stolen vehicles such as cars.

[0003] When a car with the Tracker™ system installed is stolen, the owner telephones a control centre and alerts the control centre that his/her car is missing. The car has a transponder unit installed. The control centre then transmits a radio frequency signal to activate the transponder situated in the missing vehicle. The transponder unit is actuated to transmit a second radio frequency signal which may be detected by a number of Tracker receiving units. The location of the transponder (and hence the stolen vehicle) may then be determined using conventional triangulation techniques. Using this information, the vehicle may then be recovered.

[0004] Such a system as described above possesses several disadvantages. Firstly, it may be an appreciable period of time before it is realised that the vehicle has been stolen, for example, if the owner does not frequently use the vehicle or, alternatively, if the owner has gone on holiday. This may give sufficient time for the thief to deactivate the transponder unit within the vehicle, and hence prevent the location of the vehicle.

[0005] Secondly, this location system uses a dedicated proprietary radio transmitter/receiver system for location of the vehicle. In order to successfully locate a stolen vehicle by triangulation, a network of radio signal receiver units must be installed. To install and maintain such a system covering a large area is an expensive and time consuming operation. Should such a large area network not be installed, it would be possible for car thieves to evade detection simply by moving the stolen car to an area where the coverage of the radio receivers is inadequate to permit triangulation of the position of the vehicle and its subsequent location. Additionally, the use of such a system for other vehicles such as boats leads to problems in installing and maintaining radio transmitter/receiver networks on any body of water.

[0006] It is an object of the present invention to address the above problems.

[0007] The present invention provides a security system for a transportable asset comprising a user authorisation unit for identifying that a person is an authorised user of said asset and an asset unit located in fixed relation to said transportable asset; said user authorisation unit comprising authorisation signal generator

means for generating an authorisation signal, and authorisation signal transmitter means for transmitting said authorisation signal; said asset unit comprising signal receiver means for receiving said authorisation signal, position determination means for determining the position of said asset, position transmitter means for transmitting a signal indicative of the determined position of said asset, and sensor means for sensing if a predetermined action is performed on said asset; and actuation means for actuating said position transmitter means to transmit a signal indicative of the determined position of said asset if said predetermined action has been performed in the absence of said authorisation signal.

[0008] The present invention may thus automatically detect any one of a number of predetermined actions which might affect the security of the asset and, if no authorisation signal has been received, the asset unit will automatically transmit a signal indicating that an unauthorised action is occurring.

[0009] Preferably the security system further comprises a tracking unit located remote from said asset for monitoring the status and position of said asset, said tracking unit comprising a position receiver means for receiving said determined position and, acting in a predetermined manner upon reception of said authorisation signal.

[0010] The tracking unit may then be used to take appropriate action in the event of the asset being stolen, e.g. alerting police or the owner of the vehicle, without alerting the thieves that the theft of the vehicle has been detected.

[0011] Preferably, the asset unit further comprises an interrogating signal generator means for generating an interrogatory signal and an interrogating signal transmitter means for transmitting said interrogating signal; and said user authorisation unit comprises an interrogating signal receiver means for receiving said interrogating signal, the authorisation signal generating means being adapted to generate said authorisation signal upon receipt of said interrogating signal by said interrogating signal receiver.

[0012] Such apparatus allows handshake signalling to be performed automatically between the authorisation unit and the asset unit without any action by the authorised user.

[0013] Preferably, the position transmitter means and/or said position receiver means comprise mobile telephone units.

[0014] The security system may thus make use of a comprehensive network for communication, and such a network may also be used for location of the asset unit if desired using the transmission strengths from the asset unit to the local receivers or, alternatively from the local transmitters to the asset unit. Such a communication system also permits normal telephone and facsimile transmissions to be sent and received from the asset unit.

[0015] Preferably, the authorisation signal generator

means is adapted to generate a rolling code type signal.

[0016] Such an algorithmic code encryption technique is used for increased security, and makes difficult the grabbing and subsequent reproduction of the signal by an unauthorised user. The unit may further be adapted to make use of other anti-grabbing techniques such as, if an incorrect authorisation signal is received by the asset unit, the asset unit sending an alarm signal to a remote centre (eg. a tracking unit) and/or only accepting a limited number of authorisation signal transmission attempts in a predetermined period of time. Such techniques are commonly used to prevent people "cracking" the codes on security systems.

[0017] Preferably, the sensor means includes a memory unit for storing at regular intervals said determined position, the actuation means being adapted to actuate the transmitter to transmit a signal indicative of the determined position of said asset if the sensor means detects that the current determined position has changed from the stored determined position in the absence of said authorisation signal.

[0018] An unauthorised movement of the vehicle may thus be easily detected.

[0019] The information identifying the position of the asset may be regularly updated, so that if the asset is stolen, the last known position of the asset is accurately stored on the authorisation unit for future reference and subsequent retrieval. This may be used to overcome the problem of user's forgetting where they have placed their assets eg. car owners forgetting where they have parked their cars. Preferably, the sensor means is adapted to monitor an engine management system of the transportable asset and to sense if an engine controlled by said engine management system is actuated.

[0020] Preferably, the sensor means comprises a passive infra-red detector for detecting if a person is in said asset or in proximity to said asset.

[0021] Preferably, the sensor means comprises an ultrasonic detector for detecting if a person is in said asset or in proximity to said asset.

[0022] Preferably, the sensor means includes a CCD camera for recording an image of a person located in, or in proximity to, said asset.

[0023] The images of any thief may thus be recorded and, if preferred, transmitted to a remote location, for future identification purposes.

[0024] Preferably, the user authorisation unit further comprises a panic actuating and transmission means for actuation by a user to transmit a signal to said asset unit indicating that said user is in difficulty, said asset unit being further adapted to receive said panic signal with said actuation means being adapted for actuating said position transmitter means to transmitter signal indicative of the determined position of said asset if said difficulty signal has been received.

[0025] The authorisation unit may thus comprise one or more "panic" buttons, which may be activated if the bearer finds him or herself in difficulty e.g. under threat

of violence or simply having problems with the vehicle.

[0026] Preferably, the asset unit further comprises a microphone and a speaker to enable the use of said mobile telephone units as a conventional telephone by the user of said asset.

[0027] Preferably, the asset unit further comprises input means for control and re-programming of the functions of the asset unit.

[0028] Preferably, the input means includes a personal digital assistant with a touch sensitive screen.

[0029] Such a touch sensitive display provides intuitive style programming of the asset unit. The user may then set the functions of the asset unit as appropriate for any particular time or circumstances.

[0030] Preferably, the tracking unit further comprises a transmitter means to transmit an instructional signal to said asset unit; said asset unit signal receiver means is adapted to receive said instructional signal; and said asset unit is adapted to respond in a predetermined manner to said instructional signal.

[0031] The asset unit may thus be reprogrammed as required. For instance, should the asset be a vehicle which has broken down, the user might inform the tracking unit remote centre that this has happened, and request that the asset unit is deactivated and/or some of its alarm functions disabled or ignored. Alternatively, if the asset is stolen, the tracking unit may be used to take whatever action the user/owner of the asset or the operator of the tracking unit considers appropriate e.g. disablement of the engine management system.

[0032] Preferably, the security system further comprises a position store means adapted to store the determined position of said asset at regular time and/or distance intervals.

[0033] The security system may thus be used to keep a record of the position of the asset. Such a record may be kept by the asset unit or remote from the asset unit. Such a record would permit the owner of the asset to track the assets movement over a period of time.

[0034] For instance, if the asset is a hire vehicle, the owners might accurately track the distance and areas to which the vehicle has been driven, with this system preventing clocking occurring. Preferential hire rates may thus be applied dependent upon the areas in which the vehicle travels e.g. if the area is not of rough terrain or a high risk crime area or an area busy in traffic in which an accident is more likely to occur. On a similar note, such a technique might be used by an insurance company who may wish to vary their insurance charges for an asset such as a vehicle, dependent upon which areas the vehicle travels within.

[0035] A second embodiment of the present invention provides a method of operating a security system for a transportable asset of the type previously described; the method comprising the steps of determining the location of the asset using position determination means; the asset unit determining that if a pre-programmed condition has been sensed, and the asset unit has not received

the authorisation signal then an unauthorised person is performing an unauthorised action; the asset unit transmitting a signal identifying the determined location of the asset and indicating that the unauthorised action is occurring.

[0036] Preferably, the possible pre-programmed conditions include

- (i) movement of the asset,
- (ii) operation of the asset,
- (iii) detection of a person in, on or in the vicinity of the asset, and/or
- (iv) activation of the user authorisation unit by a user to transmit a signal identifying that the user is in difficulty.

[0037] Preferred examples of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a schematic diagram of a security system in accordance with a first embodiment of the present invention; and

Figure 2 is a schematic diagram of a security system in accordance with a second embodiment of the present invention.

[0038] In Figure 1, a security system 20 for a portable asset 22, such as a vehicle, includes a user authorisation unit 24 for identifying that the person carrying the unit is an authorised user, and an asset unit 26 mounted on or in the vehicle for monitoring the position of the vehicle and whether or not the person moving the vehicle is authorised to do so.

[0039] The user authorisation unit 24 includes an authorisation signal generator 28 and a transmitter 30 for respectively generating and transmitting a signal identifying the bearer of the unit to be an authorised person. It will be appreciated that the authorisation signal may take any one of a number of forms. For instance, the authorisation signal might be an acoustic signal, for example an ultrasonic signal, or alternatively an electromagnetic radiation signal e.g. infra-red or radio frequency. The transmitted signal may be analogue or digital, and may simply consist of a pulse or series of pulses.

[0040] In a preferred embodiment the authorisation signal will include the use of "rolling code" techniques whereby the authorisation signal is generated by algorithmic code encryption, a technique which is becoming widely used and offers a relatively high level of security. The authorisation signal may contain a unique identity code linking the authorisation unit 24 to a particular asset unit 26 or set of asset units.

[0041] The generation and transmission of the authorisation signal may be initiated in a number of manners. For instance, the authorisation signal may be continuously broadcast by the authorisation unit 24, or alternatively the bearer of the authorisation unit 24 might initiate

the signal generation and transmission by, for example, pressing a button on the unit.

[0042] Preferably, the authorisation signal is only transmitted when the user authorisation user 24 is in proximity with the asset unit 26. For instance, the asset unit 26 might transmit a "handshake" signal which is received by the authorisation unit 24 and initiates the generation and transmission of the authorisation signal.

[0043] Preferably the authorisation unit 24 is convenient for carrying and, for example, might take the form of a key fob or identification badge which might be worn by the authorised user.

[0044] The asset unit 26 includes a receiver 32 for receiving the authorisation signal, a device 34 for calculating the position of the vehicle using radio frequency location techniques and a transmitter 36 for transmission of details of its identification and location in the event of a theft or unauthorised use of the vehicle.

[0045] The transmitter 35 may be a proprietary system, or alternatively may simply be a standard GSM telephone module in combination with a processing unit for detection of vehicle theft and/or unauthorised movement of the vehicle.

[0046] The location device may make use of a similar proprietary system to the Tracker™ system for location of the position of the vehicle. Alternatively, the position of the vehicle may be calculated using a GSM telephone network system, from the signal strengths from the unit and local receiving units, with calculation of the actual position either being calculated using an on-vehicle processing unit, or alternatively, calculated remote from the vehicle and transmitted to the vehicle using the GSM network.

[0047] Preferably, the position of the vehicle will be calculated using a Global Positioning System (GPS) unit on the basis of transit times of signals from satellites, possibly in conjunction with reference signals from local ground station transmitters.

[0048] Figure 2 shows a preferred embodiment of the security system located in a vehicle. The driver identification unit 50 consists of a transponder unit mounted in a key fob. A panic button 52 is mounted in the key fob device for triggering the transponder unit to transmit an "anti-hijack" signal.

[0049] Proximity of the transponder unit to the vehicle is detected by the vehicle mounted asset unit 54. The vehicle mounted asset unit 54 continuously broadcasts a low power radio transmission which, when detected by the transponder unit, activates the transponder unit to transmit an authorisation signal.

[0050] The asset unit 54 has various electrical connections 56, 58 to the vehicle 60. Such electrical connections 56, 58 may be used to power the asset unit 54. Additionally, the asset unit 54 may contain a battery system for protecting system information in volatile memory for a period of time e.g. one year after disconnection from the main vehicle supply. The asset unit 54 will be designed to withstand the electrical environment com-

mon to road vehicles, including alternator load dump transients.

[0051] The electrical connections 56 58 may additionally be linked into the engine management system of the vehicle in order to monitor and/or control the operation of the vehicle such as the engine, the braking system and/or the central locking system.

[0052] A Global Positioning System 62 is used to provide latitude and longitude information for the surveillance device 54. The GPS may use a 1.5 GHz radio receiver 62A to detect the signals from the satellites. A computing unit, for example a 32 bit FT-20GP1 micro-processor 64, may be used to perform the mathematical part of the position calculation, in addition to controlling the local vehicle supervision and driver interface.

[0053] A GSM telephone system 66 provides facilities for data exchanges between the unit 54 and a remote location eg. the owner or a control centre via the cellular telephone network. Using such a telephone system, a range of additional facilities from facsimile to full speech transmissions are available.

[0054] Additionally, sensors may be added to the unit 54 to provide alarm functions to protect against theft and detect or store an image of anyone who has accessed the interior of the vehicle. Such sensors might include passive infrared (PIR) sensors 68, ultrasonic sensors (not shown), pressure sensors (not shown) and/or a CCD camera 70.

[0055] Such a CCD camera 70 may additionally be used to transmit visual images of the driver in conjunction with a normal audio telephone signal using the GSM system to provide audio visual communications.

[0056] The asset unit 54 may also be provided with an interface to a driver display unit 72 and/or a printer for, for example, displaying facsimile or electronic mail messages, or images 74 to display the condition of the security system. Preferably, the driver display unit 72 will also include a computer unit for control of the security system and its auxiliary features by the computer unit input means.

[0057] In a preferred embodiment, the driver display unit is in the form of a personal digital assistant (PDA) with a touch sensitive screen eg a US Robotics Palm Pilot™. Such a PDA allows the vehicle operator to easily control the range of facilities and features of the system, such as dialling a number or accepting a call or message, simply by touching an area of the PDA screen. In this particular preferred embodiment, the US Robotics Palm Pilot™ unit is designed to be removable from the vehicle.

[0058] From the above description, it will be apparent that the security system may be operated in a number of modes. For instance, the vehicle unit may continuously broadcast an enquiry signal at low power for detection and subsequent response by the transponder in the key fob whenever the key fob is in range. Alternatively, the vehicle unit may only transmit such a signal when it detects an action which might effect the security

of the vehicle eg. a person approaching the vehicle, the doors of the vehicle being opened, the engine of the vehicle being started, or (using the position sensing means or information from the engine management system) the fact that the vehicle is being moved. If no response is received from the transponder unit on such an occurrence, the vehicle mounted unit 54 may then be programmed to perform a number of actions.

[0059] For instance, the vehicle unit may be programmed to simply disable the engine of the vehicle. Additionally, the unit may be programmed to dial a remote control centre identifying the occurrence, the position of the vehicle as derived by the onboard GPS, and identifying the vehicle unit. In this preferred embodiment the user id of the unit may simply be the GSM SIM card code which is allocated at manufacture.

[0060] The control centre may then clarify whether or not the user of the vehicle has authorised such an occurrence. For instance, if the vehicle containing the security device were to break down, the user might inform the control centre that his/her vehicle was to be moved without the transponder unit being in proximity.

[0061] If the occurrence is unauthorised, the remote station might then take appropriate action eg. alerting the owner, police and/or instructing the vehicle unit to take appropriate action such as disabling the vehicle's engine management system at the next appropriate moment.

[0062] For instance, the engine management system might be used to disable the engine next time the engine is switched off. The vehicle unit may issue a visual or audible signal warning the driver that this action is to be/ has been taken.

[0063] In all of the above instances, the action taken by the vehicle unit may be done covertly ie. without any indication to the vehicle occupants that such an action as informing a remote centre of the vehicle theft, or disablement of the vehicle's engine is occurring.

[0064] Alternatively, the vehicle unit may be programmed to issue any preferred audible and/or visual signals desired. For instance, such signals may be used for warning vehicle occupants or bystanders that an unauthorised action has occurred. Such signals may also be instructional, informing the occupants/unauthorised user of the actions that should be taken to gain authorisation and/or the possible consequences of unauthorised use.

[0065] Such signals may be of a sequence that is pre-programmed into the vehicle unit, or may be transmitted to the unit from a remote control centre or remote user.

[0066] General programming of the functions and responses of the security system, and in particular the asset unit, may similarly be transmitted to the vehicle, or may be performed locally using the onboard computing unit (e.g. PDA).

[0067] Preferably, the security system is constructed in a modular form, permitting easy installation of each or any preferred combination of the module units that

comprise the asset unit. However, it is equally apparent that the various parts of the system in Figure 2, for example, could be integrated into a single I.C. or module if size is of concern.

[0068] The various embodiments described above use an authorization unit which would typically be carried by a user in the form of a key fob or the like. However, a further application of the device is envisaged in the transport industry to monitor the theft of trailers on an articulated truck.

[0069] In the proposed application, the asset unit 26 is mounted in or upon the cab of a tractor unit. Thus, the tractor unit is protected from theft by the techniques described above. However, it is desirable also to protect a trailer attached to the tractor unit, to prevent the trailer being detached from the tractor unit and towed away.

[0070] To address this, rather than using a hand-held authorization unit, an authorization unit can instead be attached to the trailer. This authorization unit will have similar features to the authorization unit described above. It is preferred, however, that the authorization unit be relatively small, robust and self-powered. An antenna of physically small proportions is also desirable, to make the authorization unit when mounted upon the trailer relatively unobtrusive. A low duty cycle transmission from the authorization unit to the asset unit is used, resulting in a long battery life of the authorization unit.

[0071] A continuous signal (including a suitable security protocol such as has been described above) thus passes between the authorization unit and the asset unit when each are enabled. If the trailer is removed from the tractor unit, the asset unit stops receiving this signal, which triggers the asset unit to transmit a signal via the cellular telephone network.

[0072] No wiring or other physical connection is needed between the tractor unit and trailer. Furthermore, using a globally licence-free frequency to transmit between the tractor unit and trailer, a single device type may be developed for application in all geographies, thus minimizing difficulties arising from cross border transport.

[0073] Whilst the above security system has been described in reference to a vehicle, it would be appreciated by a skilled person that a similar system, may be used in conjunction with any movable asset e.g. boat, aeroplane, machinery or jewellery. Indeed, the device finds particular application in vending machines, where unauthorized access or vandalism can be reported automatically (via a cellular network) to a central monitoring station. Furthermore, theft of such a machine can be tracked in a similar manner to theft of a vehicle, as described above.

Claims

1. A security system for a transportable asset comprising a user authorisation unit for identifying that a

person is an authorised user of said asset and an asset unit located in fixed relation to said transportable asset;

said user authorisation unit comprising authorisation signal generator means for generating an authorisation signal, and authorisation signal transmitter means for transmitting said authorisation signal;

said asset unit comprising signal receiver means for receiving said authorisation signal, position determination means for determining the position of said asset, position transmitter means for transmitting a signal indicative of the determined position of said asset, and sensor means for sensing if a predetermined action is performed on said asset; and actuation means for actuating said position transmitter means to transmit a signal indicative of the determined position of said asset if said predetermined action has been performed in the absence of said authorisation signal.

2. The security system of claim 1, further comprising a tracking unit located remote from said asset for monitoring the status and position of said asset, said tracking unit comprising a position receiver means for receiving said determined position and means for acting in a predetermined manner upon reception of said authorisation signal.
3. The security system of claim 1 or claim 2, wherein said asset unit further comprises an interrogating signal generator means for generating an interrogatory signal and an interrogating signal transmitter means for transmitting said interrogating signal; and said user authorisation unit comprises an interrogating signal receiver means for receiving said interrogating signal, the authorisation signal generating means being adapted to generate said authorisation signal upon receipt of said interrogating signal by said interrogating signal receiver.
4. The security system of any of the above claims, wherein said position determination means comprises a Global Positioning System for determining the position of the asset from the transit times of signals from satellites.
5. The security system of any of the above claims wherein said position transmitter means and/or said position receiver means comprise mobile telephone units.
6. The security system of claim 3, or the security system of claim 4 or claim 5 when dependent upon claim 3, wherein said interrogating signal transmit-

- ter means of said asset unit is adapted to transmit a signal identifying the determined position of the asset; the interrogating signal receiver means of said user authorisation unit is adapted to receive said determined position identifying signal; and said user identifying unit further comprises a position memory means for storing said determined position of said asset.
7. The security system of any of the above claims, wherein said authorisation signal generator means is adapted to generate a rolling code type signal.
 8. The security system of any of the above claims, wherein said sensor means includes a memory unit for storing at regular intervals said determined position, the actuation means being adapted to actuate the transmitter to transmit a signal indicative of the determined position of said asset if the sensor means detects that the current determined position has changed from the stored determined position in the absence of said authorisation signal.
 9. The security system of any of the above claims, wherein said sensor means is adapted to monitor an engine management system of the transportable asset and to sense if an engine controlled by said engine management system is actuated.
 10. The security system of any of the above claims, wherein said sensor means comprises a passive infra-red detector for detecting if a person is in said asset or in proximity to said asset.
 11. The security system of any of the above claims, wherein said sensor means comprises an ultrasonic detector for detecting if a person is in said asset or in proximity to said asset.
 12. The security system of any of the above claims, wherein said sensor means includes a CCD camera for recording an image of a person located in, or in proximity to, said asset.
 13. The security system of any of the above claims, wherein said user authorisation unit further comprises a panic actuating and transmission means for actuation by a user to transmit a signal to said asset unit indicating that said user is in difficulty, said asset unit being further adapted to receive said difficulty signal with said actuation means being adapted for actuating said position transmitter means to transmit signal indicative of the determined position of said asset if said difficulty signal has been received.
 14. The security system of claim 5, wherein said asset unit further comprises a microphone and a speaker to enable the use of said mobile telephone units as a conventional telephone by the user of said asset.
 15. The security system of any of the above claims, wherein said asset unit further comprises input means for control and re-programming of the functions of the asset unit.
 16. The security system of claim 15, wherein said input means includes a personal digital assistant with a touch sensitive screen.
 17. The security system of claim 2, wherein said tracking unit further comprises a transmitter means to transmit an instructional signal to said asset unit; said asset unit signal receiver means is adapted to receive said instructional signal; and said asset unit is adapted to respond in a pre-determined manner to said instructional signal.
 18. The security system of any of the other claims, wherein said security system further comprises a position store means adapted to store the determined position of said asset at regular time and/or distance intervals.
 19. A transportable asset incorporating the security system as claimed in any of the above claims.
 20. The transportable asset of claim 19, wherein said asset is a vehicle.
 21. A method of operating a security system for a transportable asset, the security system comprising a security system as claimed in any of the above claims; the method comprising the steps of
 - determining the location of the asset using position determination means;
 - the asset unit determining that if a pre-programmed condition has been sensed, and the asset unit has not received the authorisation signal then an unauthorised person is performing an unauthorised action;
 - the asset unit transmitting a signal identifying the determined location of the asset and indicating that the unauthorised action is occurring.
 22. The method of operating a security system as claimed in claim 21, wherein the possible pre-programmed conditions include
 - (i) movement of the asset,
 - (ii) operation of the asset,
 - (iii) detection of a person in, on or in the vicinity of the asset, and/or
 - (iv) activation of the user authorisation unit by

a user to transmit a signal identifying that the user is in difficulty.

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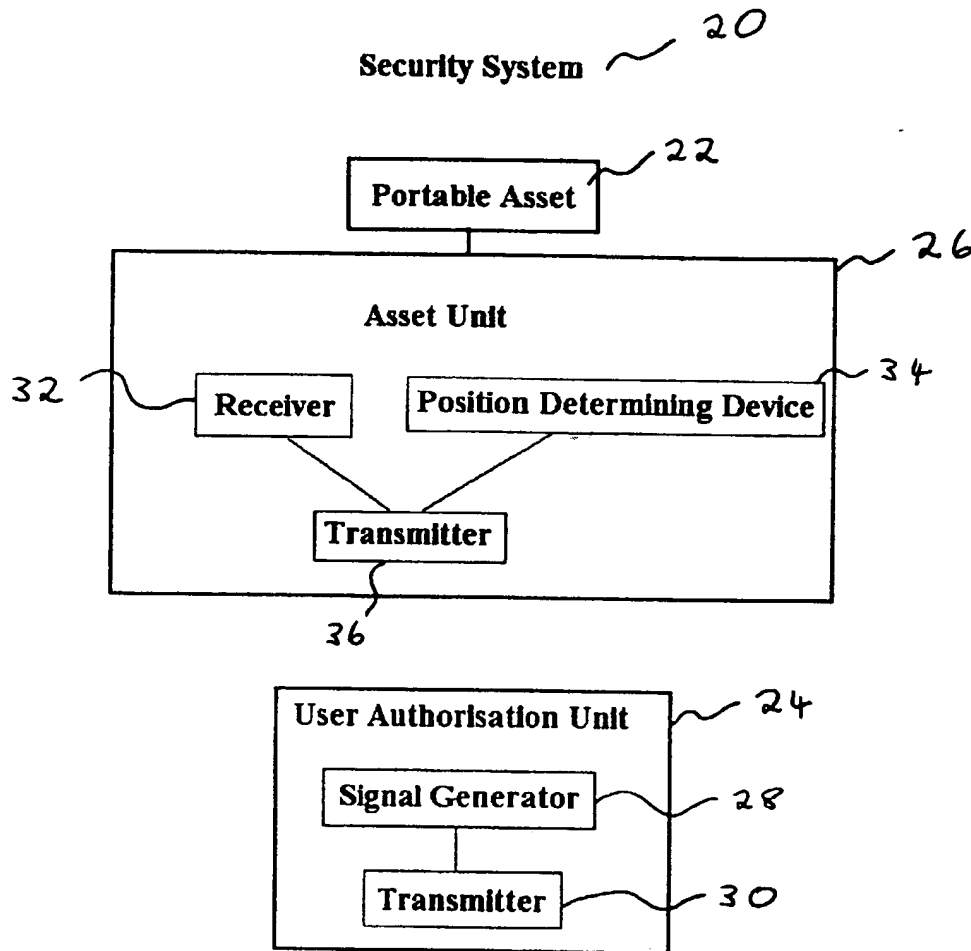


Figure 1

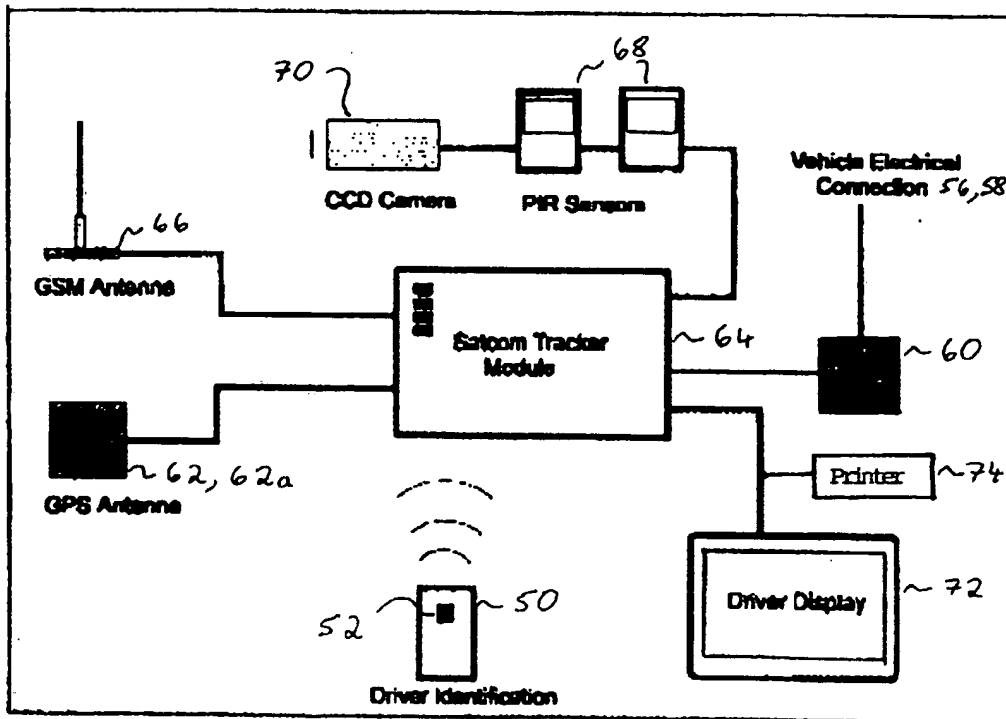
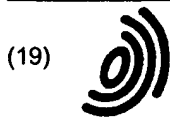


Figure 2



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(54) Security system

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When the portable asset (22) is stolen or otherwise moved without first receiving an authorization signal, a transmitter (36) therein transmits a signal identifying the asset unit (26) for example via a standard cellular telephone network. The asset unit (26) also includes a location device which allows the location of the asset (22) to be determined if stolen.

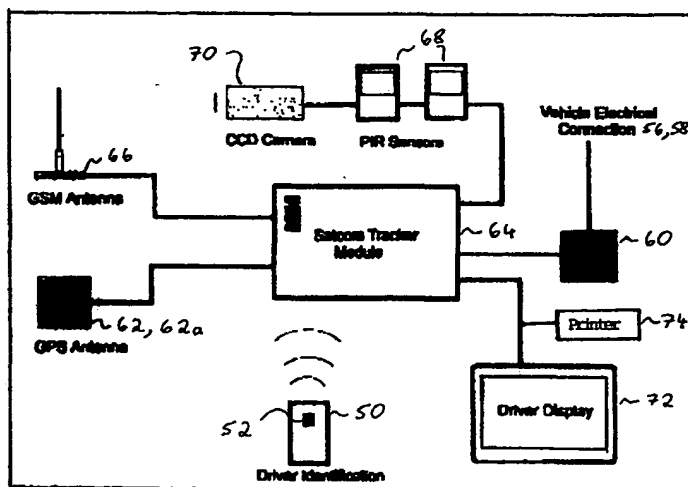


Figure 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 9732

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cls)
X	EP 0 242 099 A (ADVANCED STRATEGICS INC) 21 October 1987 (1987-10-21)	1,2,4,5, 7,8,10, 12,14, 15,17-21	B60R25/10
Y	* page 2 - page 5; figures 1-9 * * page 8, line 23 - line 34 *	3,6,13, 22	
X	GB 2 274 188 A (FOUAD TAREK AHMED ; PLUMRIDGE STEPHEN NEIL JAMES (GB)) 13 July 1994 (1994-07-13) * page 2 *	1,13	
Y	US 5 515 043 A (NIXON DAVID C ET AL) 7 May 1996 (1996-05-07) * column 2, line 35 - column 6, line 27; figures 1-14 *	13,22	
A	GB 2 305 285 A (ROVER GROUP) 2 April 1997 (1997-04-02) * page 8, line 8 - page 10, line 10; figure 1 *	1-22	
			TECHNICAL FIELDS SEARCHED (Int.Cls)
			B60R
A	US 5 334 974 A (MOORE JR DANIEL D ET AL) 2 August 1994 (1994-08-02) * column 5, line 4 - column 6, line 50; figures 1-8 *	13,14,17	
Y	EP 0 770 749 A (VALEO SECURITE HABITACLE) 2 May 1997 (1997-05-02) * column 2, line 16 - column 6, line 38; figures 1-4 *	3,6	
A	WO 97 24005 A (DIMINO MICHAEL) 3 July 1997 (1997-07-03) * page 7, line 15 - page 11, line 2; figures 1-17 *	1-22	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 March 2002	Examiner Kamara, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 9732

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-03-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0242099	A	21-10-1987	CA 1277400 A1	04-12-1990
			EP 0242099 A2	21-10-1987
			JP 63024395 A	01-02-1988
GB 2274188	A	13-07-1994	NONE	
US 5515043	A	07-05-1996	NONE	
GB 2305285	A	02-04-1997	GB 2335002 A , B	08-09-1999
US 5334974	A	02-08-1994	CA 2129425 A1	07-08-1993
			EP 0626088 A1	30-11-1994
			WO 9316452 A1	19-08-1993
			US 5808564 A	15-09-1998
EP 0770749	A	02-05-1997	FR 2740500 A1	30-04-1997
			FR 2740501 A1	30-04-1997
			DE 29623461 U1	23-07-1998
			EP 1085147 A2	21-03-2001
			EP 1158122 A2	28-11-2001
			EP 0770749 A2	02-05-1997
			JP 9177401 A	08-07-1997
			US 5929769 A	27-07-1999
WO 9724005	A	03-07-1997	US 5918180 A	29-06-1999
			AU 1334197 A	17-07-1997
			WO 9724005 A1	03-07-1997

EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82